James Sagner, *Cashflow Reengineering*, AMACOM, 1997

CHAPTER 5

PRODUCT PLANNING, PRICING AND PROFITABILITY ANALYSIS

MAKE NO LITTLE **PLANS**; THEY HAVE NO MAGIC TO STIR MEN'S BLOOD.

Daniel Hudson Burnham (Chicago architect) 1846 - 1912

I DON'T GIVE A (EXPLETIVE) WHAT HAPPENS. I WANT YOU ALL TO

STONEWALL IT, LET THEM PLEAD THE FIFTH AMENDMENT,

COVER-UP OR ANYTHING ELSE, IF IT'LL SAVE IT, SAVE THE **PLAN**.

Richard M. Nixon (1913-1994)

Cashflow reengineering requires analysis of the balance sheet and the income statement. This chapter examines cash from the general view of both, while Chapters 6 through 8 review specific income statement elements and Chapter 9 examines selected balance sheet components.

In accounting terms, cash is an asset, but in operating terms, cash directly affects and is changed by income statement components. We begin our financial statement discussion with a macro view of cash: profitability analysis as it affects cash and its resulting impact on the balance sheet.

Profitability planning matches price, volume and the relevant cost structure for a product or service. The evaluation of product planning and pricing strategy, including profitability

analysis, is usually the responsibility of managers in sales, marketing or strategic planning. This important function rarely involves the participation of any financial manager, despite the fact that profitability analysis requires financial expertise.

Profitability analysis nearly always exists in the corporate world as an historical reporting of completed events. Accountants and financial analysts review profits to report on completed fiscal periods or on specific projects. Financial analysts evaluate profits against equity (ROE), sales (return-on-sales), or assets (ROA), or against results in earlier periods. If it is used at all in the planning stage, profitability analysis is conducted in strategic planning or marketing, areas geared toward investment rather than the careful consideration of costs, sales, and cashflow.

Cash inflows and outflows are often considered in corporate finance when making decisions regarding the costs versus the returns of a proposed investment. The cost is usually measured as the *net present value* (NPV), which is the present value[1] of the flows of cash netted to a single dollar amount, as valued at the company's cost of capital. A positive NPV is usually considered as sufficient to proceed with the proposed investment.

The IRR and the MCC

For convenience, many analyses use an alternative measure, the *internal rate of return* (IRR), which yields nearly the same result as the NPV.[2] The IRR is that interest rate which

[1]Present value is the worth of a dollar today received or spent at a specific time in the future at an assumed interest rate.

[2]Describe differences

makes the total of the present value of cash outflows and inflows equal. IRR's are convenient in that they can be directly compared to the cost of funds, as both numbers are stated as percentage amounts. The cost of funds, or more correctly, the cost of capital, has two different uses, the *marginal cost of capital* (MCC) and the *average cost of capital* (ACC).

Cost of capital, usually stated as a percentage*,* is the cost of using debt and equity capital to finance the activities of a business. The *weighted average cost of capital* is the current dividend, interest and retained earnings cost of financing the business. The *marginal cost of capital* is the projected future cost of financing the business based on expected returns by the credit and equity markets. We will be using the MCC in the discussion in this chapter and the ACC in Chapter 9.

Despite the well established use of these methods in corporate finance, problems arise when they are applied to reengineering efforts:

Timing and Causes of Cashflows. The IRR is typically calculated on the basis of annual flows rather than a shorter period of time (daily, weekly, or monthly). The cash outflow or inflow is presumed to be spent or collected at the end of the year. The problem with this assumption is that cash is often spent early in Period 1 and not received until late in that period or in subsequent periods. Such timing, as we will see in cases later in this chapter, can convert an acceptable target profit to a mediocre actual profit or loss.

The IRR should be calculated on finer time breaks than annual in order to accurately reflect the actual inflows and outflows of cash. Yet even the fine tuning of IRR's does little to improve the quality of the data used; who is to say that a cash inflow

will really occur in year 2, or that it will be of a certain amount? Furthermore, even daily intervals do not tell us much about potential problems or possible solutions. As we'll see in the cases for this chapter, an inflow or outflow is caused by many factors,

Rate of Return Uncertainty. The financial markets change their rate of return requirements based on such varied economic factors as interest rates, the performance of the equity markets, industry and company profitability, and hundreds of other variables. An MCC assumption today has only limited relation to the MCC of tomorrow, despite the fact that many corporate decisions involve intermediate and long-term time horizons. Even if cash inflow and outflow projections are met as forecast, the IRR may be below the MCC by the time revenue begins.

Logic Circularity. IRR's calculate the return from a project based on assumptions about cashflows prior to proceeding with the investment decision. MCC's assume that funds can be raised based on the profitability of the ongoing business; they are not developed from the risk or uncertainty of the new project. However, profitability and cost experience from an existing portfolio of activities have only a tangential relationship to new products, markets and customers. The development of sales may take longer to accomplish than forecast, and costs may be higher than expected.

The real culprit is the timing of the cash inflows and outflows as they relate to the cashflow timeline discussed in Chapter 2. For example, consider a heavy equipment manufacturer with sales of $500 million per year and the following top portion of the income statement:

Table 5-1: Manufacturing Company Income Statement

			% OF SALES
Sales		$500.0 million	100.0%
Less: Materials	$3XX million		
Labor	50 million		
Overhead	25 million		
Manufacturing Costs		447.5 million	89.5%
Gross Margin		$52.5 million	10.5%
Less: Sales and G&A Expenses		27.5 million	5.5%
Net Profit		$25.0 million	5.0%

The result is a **target** gross margin of 10.5%, against which selling, general, and administrative expenses are charged. With invested capital of $250 million, the **target** return-on-equity capital (ROE) is 10%[3], a respectable return and well above the current 30 Year U.S. Treasury Bond rate (62-7%). Is it reasonable to assume that a new investment will generate equivalent profitability, cashflow, and ROE?

We'll see in the following pages how such assumptions can be incorrect.

Cashflow Reengineering Profitability Analysis

Cashflow reengineering brings the skills of finance to the product planning and pricing process. We analyze the actual cash outflows supporting specific cost elements for each sales

[3]$25 million net profit ÷ $250 million invested capital

activity to determine whether target returns can be achieved. The cases which follow are from a heavy equipment manufacturing company and two service businesses--a health insurance firm and a commercial finance company.

At the heart of profitability analysis is the concept of *opportunity cost*, analyzed by the calculation of the realized gross margin. Opportunity cost is the consideration of alternative uses for the capital (or other scarce resources) invested in a production or service process, with the normative alternative use frequently defined as the organization's cost of capital[4] or cost of funds. *Realized gross margin* is the deduction from the company's target gross margin of impacts due to timeline delays from work-days requirements. *Work-days* is the count of days required to complete each timeline element.

In other words, the profitability of an activity should be measured against the cost of debt and equity investment necessary to fund the activity. Too often sales or product managers develop analyses without this perspective, and investments which appear moderately profitable in plans and budgets become significant losses in the real world of competition and cost overruns.

Profitability in a Manufacturing Company

The cost elements of manufacturing and invoicing do not include the time value of money, that is, the period during which company funds are invested in materials, labor and overhead

[4]*Cost of capital* is the cost of using debt and equity capital to finance the activities of a business, usually stated as a percentage. The *weighted average cost of capital* is the current dividend, interest and retained earnings cost of financing the business. The *marginal cost of capital* is the projected future cost of financing the business based on expected returns by the

during the manufacturing process. To analyze this critical but overlooked element, the various timeline elements of the heavy equipment manufacturer presented in Table 5-1 are restated in Table 5-2 as "work-days" and "gross margin (GM) % impact."

Table 5-2: Manufacturing Company Work-days and Gross Margin Impact

(derived from Table 5-1)

DETAIL OF INCOME STATEMENT		WORK-DAYS	GM%* IMPACT
Target Gross Margin		165.0	10.50
Less			
Materials	(5-2.a)	90.0	2.10
Work-in-Process	(5-2.b)	74.0	1.75
Invoice Preparation	(5-2.c)	60.0	1.40
Receipt of Good Funds	(5-2.d)	46.0	1.10
Total Work-days		270.0	
Equals			
Realized Gross Margin %			4.15

*GM% = gross margin percentage

These data indicate that while the **target** time to manufacture (including the purchasing of materials) is 165 days (or 52 months), the **actual** time to manufacture and invoice is an astounding 270 days, or 9 months. These additional 105 days (32 months) cause the gross margin percentage to decline from the target 10.5% to a realized 4.2%. After sales and general and administrative expenses, net profits become fairly slim (2.5% in this particular case), resulting in

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credit and equity markets.

a return-on-capital of 5%. This is below the opportunity cost of either the 30 Year Treasury Bond rate or perhaps 10+% using a realistic weighted marginal cost of capital.

In other words, anytime the actual ROE falls below the relevant opportunity cost or cost of capital, the correct financial decision is to eliminate the product being manufactured and sold.[5] The freed capital can then be invested in other projects (or in 30 Year U.S. Treasury Bonds or used to pay down borrowings).

In presenting this analysis, the financial manager would emphasize the time value of money element of the working capital cycle: the opportunity cost of investing funds in manufacturing and invoicing product significantly impacts the target return (measured as the gross margin percentage) from that product. Let's examine how that would occur at the micro level of a specific production process. All four Table 5-2 timeline elements (listed as 5-2.a through 5-2.d) contribute to the length of the cycle.

Materials (5.2a) were purchased far in advance of production, due to pricing discounts from vendors and concern for access to dependable supply sources. However, closer investigation indicated that materials had specific uses for certain customers who had not been obligated by long-term contracts to do business with the company. Therefore, much of this activity was speculative, and based only partially on reasonable forecasts of customer requirements.

Delays in manufacturing, reported on the income statement as work-in-process (5-2.b), resulted from the physical movement of materials through the work stations and from delays at

[5]This is a basic tenet of managerial finance, that the return from a project (usually calculated as the internal rate of return or IRR) must exceed the cost of funds (the marginal cost of

each work station. Investigation indicated that shop layout was not sequential, resulting in inefficient movement between shop areas and buildings. Also, scheduling at each work station was overly complex because of the need for some elaborate production activities and inspection prior to subsequent production steps.

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capital or MCC) for a project to be undertaken.

Development of *just-in-time* (JIT) processes for materials and work-in-process improvement would help reduce these cycle times. JIT essentially means having the right materials, parts and products in the right place at the right time, on the theory that excess inventory means waste and, as we have seen, cost. Basic tenets of JIT include few transactions, few "disturbances" (or periodic scheduling), the grouping of manufacturing cells (including equipment) to minimize travel distances, and a major emphasis on quality control (QC). QC is essential to avoid work stoppages and the holding of buffer or safety inventory in the event that defective materials are found.[6]

Invoice preparation delays (5-2.c) resulted from the need to collect manufacturing data from various production work areas, the verification of the data, and the matching of the draft invoices against contract requirements and limitations. The redesign of labor and materials management systems reduced data collection and review times, and automated exception reporting of actual as compared to contract specifications.

Receipt of good funds (5-2.d) involves the entire cash collection cycle, driven primarily by customer invoice review and payment authorization, and the banking of funds received. Various treasury management actions may shorten this time, including lockboxing and conversion of paper checks to electronic funds transfers. As noted in Chapter 3, the purpose of the lockbox is to hasten the processing of monies mailed to organizations. Banks intercept the mail at the Post office and deposit checks received, reducing the mailing and clearing time ("availability") by one

[6]See Thomas E. Vollmann, William Lee Berrry and D. Clay Whybark, *Manufacturing Planning and Control Systems* (2nd ed.), Dow Jones-Irwin, 1988, Chapter 7.

to two days.

? Electronic funds transfer mechanisms include clearings on a same-day basis (Fed wire) and next-day basis (ACH and EDI). The **Fed wire** system is operated by the Federal Reserve System, with payment initiated and received by banks on a same-day, final basis, that is, a payment sent cannot generally be recovered.

ACH (Automated Clearing House) transactions are batch process, store and forward, with files sent to banks by initiating organizations and transmitted electronically to the receiving bank for credit to the vendor or other payee. As the amount of data accompanying an ACH is limited, other formats with larger data fields have become available, generically known as EDI (electronic data interchange).

EDI involves the exchange of computer-readable data between trading partners, and may include financial data from the transfer of funds. EDI transactions include purchase orders, invoices, and similar types of information exchanges, as well as payments. EDI messages are transmitted through value-added communications networks (VANS) which act as electronic mailboxes to receive, store and process messages.[7]

Opportunities to reduce total cycle time toward the target of 52 months include JIT, the redesign of information systems driving invoicing, and various treasury management changes.

[7]EDI collection services are discussed in Chapter 6; EDI disbursement services are reviewed in Chapter 7.

Each must be investigated by the disciplines appropriate to the specific technique: the materials element needs input from the purchasing function, the work-in-process element should include production managers, invoice preparation requires both production and invoicing managers, and receipt of good funds has elements of receivables management--treasury, credit and collection. The development of data from these various functions demands a degree of cooperation that is not customary in many traditional line-and-staff organizations. Lack of cooperation is often the cause of failure when target returns are not achieved.

Should these efforts prove unsuccessful and the **actual** gross margin percentage fall below the target, the only alternative may be to increase prices or abandon the product. This approach can be used both in planning the pricing and profitability of products and services, and in determining the cause of failure to meet profitability targets. Our discussion is oriented more to the former role, because many companies do not adequately consider real manufacturing and invoicing cycle times prior to the commitment of capital. It's necessary to work with the managers responsible for each element in the cycle to determine realistic times. This step is all too often omitted in product profitability and pricing analysis.

Profitability in Service Organizations

Unlike manufacturing companies, service industries are quite dissimilar in their operations and invoicing cycles. Each service industry has its own unique production processes, its own nomenclature, and often its own terms for settling transactions. The following examples illustrate proper analytical procedure.

In the insurance market, group health coverage is frequently provided as an administrative service (known as "ASO" or alternate funded business) rather than as a traditional, fully insured product. The insurance company is engaged by the corporate client to provide coverage to its employees, paying providers (hospitals, physicians) or employees as claims are settled. However, any funds paid by the insurer are reimbursed by the company, with the claim service priced as an administrative fee.

Consider an insurance company with a target of two days of average claim payments held awaiting the replenishment of advances made by the insurer on settled claims. This results in a **target** gross margin percentage of 0.65%, which, while appearing to be unrealistically low, is actually fairly significant compensation considering the limited role performed by the insurer--especially when applied against a $500 million annual cash flow. With invested capital of $30 million for that segment of the business, the resulting **target** return-on-equity is 10.8%.

A financial analysis similar to Table 5-2 shows the following, however:

Table 5-3

Services Organization Work-days and Gross Margin Impact

(Insurance Company)

		WORK-DAYS	GM% IMPACT
Target Gross Margin		2.0	0.65
Less			
Client Funds Advanced	(5-3a)	-0.7	-0.25
Insurer Bank Fees Paid	(5-3b)	0.9	0.30
Insurer Bank Balances Advanced	(5-3c)	2.4	0.80
Insurer ASO Costs	(5-3d)	1.1	0.30
Total Work-days		3.7	
Equals			
Realized Gross Margin			-0.5

Because of incorrect assumptions regarding the financial obligations assumed by the insurer for this business, there was an inadequate understanding of the extent of bank balances advanced and

bank fees absorbed prior to reimbursement by the corporate client. Thus, a **target** gross margin of 0.65% became an **actual** loss of 0.50%, even before sales and other general and administrative expenses are paid.

Table 5-3a through 5-3d timeline elements make varying contributions to the length of the cycle, 3.7 days versus the **target** of 2.0 days. Client funds advanced (5-3a) acts positively: monies are represented which have been advanced in expectation of claim payments made to insureds or providers. Insurer bank fees paid (5-3b) are the charges for maintaining bank accounts on behalf of client organizations from which claims are paid. Bank charges primarily are for checks paid and for wire transfers received (or other funding mechanisms).

Insurer bank balances advanced (5-3c) represent the cost of monies advanced by the insurer to cover claim checks issued. If these advances had not been made, insured and provider checks would not have been honored by the issuing bank. In all cases, the advance is repaid by the client company, but the insurer is out the funds for an average of 2.4 days. Insurer ASO costs (5-3d) are the various administrative cost categories in operating this business, including personnel, systems and other expenses.

Potential areas of improvement include the following:

- require corporations to provide reimbursement by Fedwire on the day that claims are paid, or advance 2 to 3 days funds prior to payment (based on data from the checks issued file);
- pay claims off the company's bank account to eliminate the use of insurer funds;

- base reimbursements on issued (versus paid) disbursements, allowing 1+ days of additional funding to the insurer.

Expense avoidance and/or additional revenue are required to develop a profitable business environment, involving the coordinated efforts of marketing, systems, claims and treasury managers. In the absence of these initiatives, the result may be similar to that of our manufacturing company example: price increases or abandonment of the market. Many insurance companies writing health coverage have in fact stopped selling such insurance because of insufficient profitability.

Other Service Industry Analyses

Similar analyses could be presented for other types of service organizations, each displaying costs elements relevant to the specific industry. For example, in the commercial finance industry, various types of lending are made to dealers selling vehicles and large equipment. The automobile industry refers to these arrangements as "floor planning". Vehicles are financed until sold, as manufacturers, due to business practice, expect payment on delivery to their dealers.

Cost elements include the following:

Method of payment: "Paid as Sold" or "Scheduled Liquidation". Paid as Sold liquidates loan as inventory is sold; Scheduled Liquidation repays loans based on specific calendar timing regardless of sales from inventory. Paid as Sold is preferred by clients as repayments are not made until inventory is liquidated, normally as retail sales. Scheduled liquidation is preferred by commercial finance companies as cashflows are "assured" on

specific dates, assuming clients make the payments as specified by contract.

Interest charges. A major impact on the realized gross margin percentage, interest charges are set by formula, but may be negotiated with the client in order to win or retain business.

Late fees. Late fees result from the failure to make timely Scheduled Liquidation payments based on contractural terms. Paid as Sold payments are also subject to late fees, if, on audit, it is determined that inventory has been sold but timely payment has not been made.

Rebates of floor planning charges. Manufacturer and distributors often rebate interest charges incurred by dealers to promote sales, and are therefore shown as a negative calculation.

The profitability of specific deals, and of categories of deals by manufacturer, by product, by geographic region, and by dealer will vary from the **target** gross margin, and will often lead to inadequate returns. In this example (Table 5-4), the target gross margin of 5% was actually 2%, significantly below the business goal of the commercial finance company.

Table 5-4

Services Organization Work-days and Gross Margin Impact

(Commercial Finance Company)

DETAIL OF INCOME STATEMENT		WORK-DAYS	GM% IMPACT
Target Gross Margin		10.8	5.00
Less			
Method of Payment	(5-4a)	4.5	0.75
Interest Charges	(5-4b)	9.0	1.50
Late Fees	(5-4c)	6.0	1.00
Rebates of Floor Planning Charges	(5.4d)	-1.5	-0.25
Total Work-days		18.0	
Equals			
Realized Gross Margin			2.00

Table 5-4a through 5-4d timeline elements contribute to the length of the cycle, 18.0 days versus a **target** of 10.8 days. Areas of potential improvement include:

- more vigorous auditing of Scheduled Liquidation clients to ascertain that payments are

made as inventory is liquidated (5-4a);

- greater control over negotiation of interest charges and other charges by sales (5-4b);
- the collection of appropriate late fees (5-4c).

In general, there should be a required threshold profitability by deal to justify each financing agreement. In the absence of these initiatives, the result may be similar to that of our previous examples: price increases or abandonment of the market.

Planners and Cashflow Reengineers

Traditional capital budgeting procedures use data derived from existing financial statement relationships, primarily profitability and the costs of capital, to project costs and returns for new investments. Product planning is one of the most important functions in any organization, yet one of the most poorly managed of all business functions. As we have seen in three situations taken from manufacturing, group health insurance and automobile financing, plans are often based on unrealistic expectations for important cost elements. This is due to the failure of marketing managers and planners to fully understand the cost dynamics often managed by other functional areas.

Cashflow reengineering analysis reexamies all pricing and cost assumptions within a business activity, helping managers make rational allocations of capital to deserving projects. Those projects are ones in which the actual return exceeds the appropriate opportunity cost. In this period of narrowing profit margins, it is essential to expand these techniques of cashflow reengineering in order to make better marketing and product planning decisions.